

WHAT IS CLAIMED IS:

1. A motion controlled handheld device comprising:
  - a display having a viewable surface and operable to generate an image;
  - a motion detection module operable to detect motion of the device within three
  - 5 dimensions and to identify components of the motion in relation to the viewable surface; and
  - a motion response module having a first mode of operation and a second mode of operation;
    - the motion response module operable in the first mode of operation to monitor
    - 10 the motion of the device, to determine that the motion matches a predetermined mode selection trigger, and, in response to determining that the motion matches the predetermined mode selection trigger, to measure a baseline orientation of the device based on measurements of the components, and to switch to the second mode of operation;
    - 15 the motion response module operable in the second mode of operation to monitor the motion of the device, to determine movement of the device in relation to the baseline orientation using the components of the motion, and to modify the image in response to the movement.
- 20 2. The motion controlled handheld device of Claim 1, wherein the motion response module is further operable to determine that the motion matches the predetermined mode selection trigger by detecting stabilization of the components of the motion.
- 25 3. The motion controlled handheld device of Claim 1, wherein:
  - the mode selection trigger comprises an engagement gesture defined by a particular movement of the device with respect to a first position of the device; and
  - the motion response module is further operable to determine that the motion matches the predetermined mode selection trigger by:
    - 30 tracking motion of the device matching to the engagement gesture; and
    - detecting stabilization of components of the motion of the device following detection of the engagement gesture.

4. The motion controlled handheld device of Claim 1, wherein the motion response module is further operable in the first mode of operation to disregard motions that do not match the predetermined mode selection trigger.

5

5. The motion controlled handheld device of Claim 1, wherein the motion response module is further operable, upon switching to the second mode of operation, to detect a first motion after entering the second mode of operation, to determine that the first motion fails to match to a predefined set of motions, and to switch to the first mode of operation in response to determining that the first motion fails to match.

10

6. The motion controlled handheld device of Claim 1, further comprising:  
a gesture database comprising a plurality of gestures, each gesture defined by a motion of the device with respect to a first position of the device; and  
a gesture mapping database mapping each of the gestures to a corresponding command; and wherein

15

the motion response module is further operable in the first mode of operation to compare the motion of the device against an engagement gesture to determine whether the motion matches the predetermined mode selection trigger; and

20

the motion response module is further operable in the second mode of operation to match the motion of the device against the gestures to determine a received gesture, to identify the corresponding command mapped to the received gesture, and to execute the identified command to modify the current image.

7. The motion controlled handheld device of Claim 6, further comprising:  
a first accelerometer operable to detect acceleration along a first axis;  
a second accelerometer operable to detect acceleration along a second axis, the  
second axis perpendicular to the first axis; and  
5 a third accelerometer operable to detect acceleration along a third axis, the  
third axis perpendicular to the first axis and perpendicular to the second axis; and  
wherein:  
the gesture database further defines each of the gestures using a sequence of  
accelerations;  
10 the motion detection module is further operable to detect motion of the device  
using accelerations measured by the first accelerometer, the second accelerometer,  
and the third accelerometer; and  
the motion response module is further operable to match the accelerations  
measured by the motion detection module against gesture definitions in the gesture  
15 database.

8. A method for controlling a handheld device comprising:  
generating an image on a viewable surface of the handheld device;  
detecting motion of the device within three dimensions;  
identifying components of the motion in relation to the viewable surface;  
5 in a first mode of operation:  
monitoring the motion of the device;  
determining that the motion matches a predetermined mode selection  
trigger; and  
in response to determining that the motion matches the predetermined  
10 mode selection trigger, measuring a baseline orientation of the device based on  
measurements of the components and switching to a second mode of operation;  
in the second mode of operation:  
monitoring the motion of the device;  
determining movement of the device in relation to the baseline  
15 orientation using the components of the motion; and  
modifying the image in response to the movement.
9. The method of Claim 8, further comprising determining that the  
motion matches the predetermined mode selection trigger by detecting stabilization of  
20 the components of the motion.
10. The method of Claim 8, wherein the mode selection trigger comprises  
an engagement gesture defined by a particular movement of the device with respect to  
a first position of the device, the method further comprising:  
25 tracking motion of the device matching to the engagement gesture; and  
detecting stabilization of components of the motion of the device following  
detection of the engagement gesture.
11. The method of Claim 8, further comprising, in the first mode of  
30 operation, disregarding motions that do not match the predetermined mode selection  
trigger.

12. The method of Claim 8, further comprising, upon switching to the second mode of operation:

detecting a first motion after entering the second mode of operation;

determining that the first motion fails to match to a predefined set of motions;

5 and

switching to the first mode of operation in response to determining that the first motion fails to match.

13. The method of Claim 8, further comprising:

10 maintaining a gesture database comprising a plurality of gestures, each gesture defined by a motion of the device with respect to a first position of the device; and

maintaining a gesture mapping database mapping each of the gestures to a corresponding command; and wherein

15 in the first mode of operation, comparing the motion of the device against an engagement gesture to determine whether the motion matches the predetermined mode selection trigger; and

in the second mode of operation, matching the motion of the device against the gestures to determine a received gesture, identifying the corresponding command mapped to the received gesture, and executing the identified command to modify the  
20 current image.

14. The method of Claim 13, wherein:

the gesture database further defines each of the gestures using a sequence of accelerations; the method further comprising:

25 detecting acceleration along a first axis;

detecting acceleration along a second axis, the second axis perpendicular to the first axis; and

detecting acceleration along a third axis, the third axis perpendicular to the first axis and perpendicular to the second axis;

30 detecting motion of the device using accelerations measured by the first accelerometer, the second accelerometer, and the third accelerometer; and

matching the accelerations against gesture definitions in the gesture database to identify potential indicated ones of the gestures.

15. Logic for controlling a handheld device, the logic embodied in a computer readable medium and operable when executed to perform the steps of:

generating an image on a viewable surface of the handheld device;

detecting motion of the device within three dimensions;

5 identifying components of the motion in relation to the viewable surface;

in a first mode of operation:

monitoring the motion of the device;

determining that the motion matches a predetermined mode selection trigger; and

10 in response to determining that the motion matches the predetermined mode selection trigger, measuring a baseline orientation of the device based on measurements of the components and switching to a second mode of operation;

in the second mode of operation:

monitoring the motion of the device;

15 determining movement of the device in relation to the baseline orientation using the components of the motion; and

modifying the image in response to the movement.

16. The logic of Claim 15, further operable when executed to determine  
20 that the motion matches the predetermined mode selection trigger by detecting stabilization of the components of the motion.

17. The logic of Claim 15, wherein the mode selection trigger comprises an engagement gesture defined by a particular movement of the device with respect to  
25 a first position of the device, the logic further operable when executed to perform the steps of:

tracking motion of the device matching to the engagement gesture; and

detecting stabilization of components of the motion of the device following detection of the engagement gesture.

30

18. The logic of Claim 15, further operable, in the first mode of operation, to disregard motions that do not match the predetermined mode selection trigger.

19. The logic of Claim 15, further operable, upon switching to the second mode of operation, to:

detect a first motion after entering the second mode of operation;

5 determine that the first motion fails to match to a predefined set of motions;  
and

switch to the first mode of operation in response to determining that the first motion fails to match.

10 20. The logic of Claim 15, further operable when executed to perform the steps of:

maintaining a gesture database comprising a plurality of gestures, each gesture defined by a motion of the device with respect to a first position of the device; and

15 maintaining a gesture mapping database mapping each of the gestures to a corresponding command; and wherein

in the first mode of operation, comparing the motion of the device against an engagement gesture to determine whether the motion matches the predetermined mode selection trigger; and

20 in the second mode of operation, matching the motion of the device against the gestures to determine a received gesture, identifying the corresponding command mapped to the received gesture, and executing the identified command to modify the current image.



21. The logic of Claim 20, wherein:

the gesture database further defines each of the gestures using a sequence of accelerations; the logic further operable when executed to perform the steps of:

detecting acceleration along a first axis;

5 detecting acceleration along a second axis, the second axis perpendicular to the first axis; and

detecting acceleration along a third axis, the third axis perpendicular to the first axis and perpendicular to the second axis;

10 detecting motion of the device using accelerations measured by the first accelerometer, the second accelerometer, and the third accelerometer; and

matching the accelerations against gesture definitions in the gesture database to identify potential indicated ones of the gestures.

22. A motion controlled handheld device comprising:
- means for generating an image on a viewable surface of the handheld device;
  - means for detecting motion of the device within three dimensions;
  - means for identifying components of the motion in relation to the viewable
- 5 surface;
- means for, in a first mode of operation:
    - monitoring the motion of the device;
    - determining that the motion matches a predetermined mode selection
- 10 trigger; and
- in response to determining that the motion matches the predetermined
- mode selection trigger, measuring a baseline orientation of the device based on
- measurements of the components and switching to a second mode of operation;
- means for, in the second mode of operation:
    - monitoring the motion of the device;
- 15 determining movement of the device in relation to the baseline
- orientation using the components of the motion; and
- modifying the image in response to the movement.